**TECHNOLOGY NEEDS/OPPORTUNITIES STATEMENT**

**RETRIEVAL OF WASTE HEEL FROM VAULT TANKS AT 340 FACILITY**

***Identification No.:*** RL-DD082
***Date:*** November 2001

***Program:*** River Corridor Waste Management
***OPS Office/Site:*** Richland Operations Office/Hanford Site
***PBS Number:*** RL-RC05
***Waste Stream:*** TRU-MW Liquid and Sludge Heel in 340 Vault Tanks (to be eventually transferred to RL-HLW-20 tank waste)
***TSD Title:*** N/A
***Operable Unit (if applicable):*** N/A (near 300-FF-2)
***Waste Management Unit (if applicable):*** N/A
***Facility:*** 340 Vault Facility, Hanford's 300 Area

***Priority Rating:***

This entry addresses the "Accelerated Cleanup: Paths to Closure (ACPC)" priority:

____ 1. Critical to the success of the ACPC.
_X_ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high life-cycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays).
____ 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

***Need Title:*** Retrieval of Waste Heel from Vault Tanks at 340 Facility

***Need/Opportunity Category:*** *Technology Opportunity* -- The Site desires an alternative to the current baseline approach and schedule.

***Need Description:*** A method is needed for removing residual waste from two 15,000 gallon tanks. The tanks are situated below grade in a concrete vault. Waste remaining in each tank is comprised of about 1,100 gallons of liquids, sludge, solids and dispersible materials. A similar need is documented in Technology Need RL-DD09.

***Schedule Requirements:***

Earliest Date Required: (01/01/02)
Latest Date Required: (09/30/06)

These tanks are part of a Tri-Party Agreement milestone (M-92-13/16) related to "Special Case Waste" disposition in the 300 Area. These milestones involve a large set of 300 Area waste streams which must be fully dispositioned before FY 2006 – about one-third

of the entire set must be addressed by 2002, and other third by 2004, and finally all waste dispositioned by the end of FY 2006.

***Problem Description:*** Tank internals that may challenge the cleanout effort include a four-paddle, 42-inch diameter, agitator located near the bottom of the tank but above the tank heel level. The tanks also have three, concentrically spaced, vertical support baffles in the interior knuckle region of the tank (likely regions of sludge "hold-up")

As part of the initial 340 Facility deactivation activities in 1998, the tanks were pumped to remove all but the last/lowest 20 inches of liquids and sludge. This 20-inch waste level represents the lowest elevation of the in-tank pump inlet.

Until 1998, the 340 Facility received liquids wastes from a variety of sources in Hanford's 300 Area, and then transferred the liquids to a railroad tanker for transport to the 200 Area Tank Farms. In 1998, the Hanford railroad network was shut down as was the 340 waste receiving and transfer operations.

***Potential Life-Cycle Cost Savings of Need (in $000s) and Cost Savings Explanation:*** Removal of the waste heel may allow for a down-classification from a Non-Reactor Nuclear Facility (Hazard Class III) to Radiological Facility status. This effort would support the ability to downgrade the facility from a "Major Stack" classification for air permitting concerns. This change could also allow for reduction of the 340 Facility FSAR or Interim Safety Basis requirements. The removal of the liquid/sludge heels will result in a mortgage reduction for the life of the facility. The estimated cost to remove the heels will be recovered by FY 2003, resulting in an estimated savings of $2.8M by FY 2006 (based on the associated TPA Milestone date).

***Benefit to the Project Baseline of Filling Need:*** Safety/environmental hazard located near the Columbia River.

***Relevant PBS Milestone:*** TBD

***Functional Performance Requirements:*** The selected technology should be capable of flushing all portions/sides of the internal structures. The technology may need to utilize flexible piping, as direct access to vertical tank risers may not be practical. The possibility also exists for installing new tank risers and/or core drilling cover blocks if necessary/optimum for equipment location. Also, relocating attachment points for the current fall protection cables could free up access hatches for such use. The selected technology should minimize the introduction of additional liquids. The waste heel does include TRU nuclides, and may be present in concentrations that would classify the waste as TRU.

***Work Breakdown Structure (WBS) No.:*** 1.2.3.2.3 – 340 Deactivation

***TIP No.:*** N/A

***Justification for Need:***

***Technical:*** Elimination of the residual heels and reduction of the radiological field is necessary before the tanks can be size reduced and/or removed for disposal.

***Regulatory:*** See reference to Tri-Party Agreement milestone (M-92-13/16) noted above. State and Federal regulators have established a compliance order for dealing with a number of "Special Case Waste" streams in the 300 Area. The heel remaining in the 340 tanks is included in this TPA milestone.

***Environmental Safety and Health:*** The proximity of the tanks to the Columbia River and the City of Richland strengthens the need to accelerate heel removal.

***Cultural/Stakeholder Concerns:*** The 340 High Level Vault Tanks are located within 500 yards of the Columbia River, and just north of the City of Richland property limits.

***Other:*** None identified.

***Current Baseline Technology:*** The 340 Facility Project Management Plan (PMP) baseline assumes use of a robotic crawler/suction system for the purpose of heel-removal cost estimates. Such an approach has since been demonstrated elsewhere at Hanford with shortcomings.

***End User:*** EM-30

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